What is claimed is:

1. A color compression apparatus, comprising:

an input portion receiving input color image data which is defined for an input-end device and which is located in a predetermined input-end gamut; and

a color compression portion converting the input color image data into output color image data which is defined for an output-end device and which is located in a predetermined output-end gamut,

the color compression portion including a hue determining portion determining hue of the input color image data based on the input color image data.

2. A color compression apparatus as claimed in claim 1, wherein the input color image data includes data of a color component of at least one of red and green,

further comprising a storage portion storing data of at least one hue that is calculated based on a measuring result of at least one color that is reproduced by the input-end device in response to input color image data indicative of at least one of primary colors of red and green,

wherein the hue determining portion determines the hue of the input color image data based on the input color image data and on the data of at least one hue.

3. A color compression apparatus as claimed in claim 1, wherein the input color image data includes data of a blue

color component,

further comprising a user-input portion allowing a user to input data of his/her desired hue of blue color, and

wherein the hue determining portion determines the hue of the input color image data based on the input color image data and on the data of the user's desired hue of the blue color.

4. A color compression apparatus as claimed in claim 1, wherein the output color image data includes data of a color component of at least one of cyan, magenta, and yellow,

further comprising a storage portion storing data of at least one hue that is calculated based on a measuring result of at least one color that is reproduced by the output-end device in response to output color image data indicative of at least one of primary colors of cyan, magenta, red, and yellow,

wherein the hue determining portion determines the hue of the input color image data based on the input color image data and on the data of at least one hue.

5. A color compression apparatus as claimed in claim 1, wherein the input color image data includes a set of data (Rin, Gin, Bin) including color components of red, green, and blue,

further comprising a storage portion storing data of hues HR and HG for red and green, the data of hue HR having a

value that is calculated based on a measuring result of a color that is reproduced by the input-end device in response to input color image data (255, 0, 0), the data of hue HG having a value that is calculated based on a measuring result of a color that is reproduced by the input-end device in response to input color image data (0, 255, 0); and

a user-input portion allowing a user to input data of his/her desired hue HB for blue, and

wherein the hue determining portion determines a hue Hin of the input color image data based on the input color image data (Rin, Gin, Bin) and on the hue data HR, HG, and HB.

6. A color compression apparatus as claimed in claim 5, wherein the output color image data includes a set of data (Cout, Mout, Yout, Kout) including color components of cyan, magenta, yellow, and black,

wherein the storage portion further stores data of hues HC, HM, and HY for cyan, magenta, and yellow, the data of hue HC having a value that is calculated based on a measuring result of a color that is reproduced by the output-end device in response to output color image data (255, 0, 0, 0), the data of hue HM having a value that is calculated based on a measuring result of a color that is reproduced by the output-end device in response to output color image data (0, 255, 0, 0), the data of hue HY having a value that is calculated based on a measuring result of a color that is

reproduced by the output-end device in response to output color image data (0, 0, 255, 0), and

wherein the hue determining portion determines the hue Hin of the input color image data based on the input color image data (Rin, Gin, Bin), on the hue data HR, HG, and HB, and on the hue data HC, HM, and HY.

7. A color compression apparatus as claimed in claim 6, wherein the hue determining portion calculates H=HR+(HY-HR) * k when Rin≧Gin≧Bin, calculates H=HG-(HG-HY) * k when Gin≧Rin≧Bin, calculates H=HG+(HC-HG) * k when Gin≧Bin≧Rin, calculates H=HB-(HB-HC) * k when Bin ≧ Gin ≧ Rin, calculates H=HB+(HM-HB) * k when Bin ≧ Rin ≧ Gin, or calculates H=HR-(HR+360-HM) * k when Rin≧Bin≧Gin, wherein k=(M-S)/(L-S), L, M, and S are respectively the maximum value, the intermediate value, and the minimum value among the values Rin, Gin, and Bin in the input color image data (Rin, Gin, Bin).

8. A color compression apparatus, comprising:

an input portion receiving input color image data which is defined for an input-end device and which is located in a predetermined input-end gamut; and

a color compression portion converting the input color image data into output color image data which is defined for an output-end device and which is located in a predetermined output-end gamut,

the color compression portion including:

a hue determining portion determining hue Hin of the input color image data;

a lightness determining portion determining lightness Vin of the input color image data; and

a lightness correcting portion correcting the lightness Vin;

the input-end gamut having a full-color lightness V0 at the hue Hin, and the output-end gamut having a full-color lightness V02 at the hue Hin,

the lightness correcting portion including a target lightness determining portion determining, based on a difference between the values V0 and V02, a target lightness "target" indicative of a full-color lightness of a corrected input-end gamut at the hue Hin, the lightness correcting portion correcting the lightness Vin based on the target lightness "target".

9. A color compression apparatus as claimed in claim 8, wherein the lightness determining portion determines the target lightness "target" as equal to the full-color lightness V02 when the difference between the values V0 and V02 is smaller than or equal to a predetermined threshold value.

10. A color compression apparatus as claimed in claim 9, wherein the lightness determining portion determines the

target lightness "target" as a value between the values V0 and V02 when the difference between the values V0 and V02 is greater than the predetermined threshold value.

11. A color compression apparatus as claimed in claim 10, wherein the lightness determining portion determines, when the difference between the values V0 and V02 is greater than the predetermined threshold value, the target lightness "target" by calculating an equation of target = K * (V0-V02)+V02, wherein $0 \leqq K \leqq 1$.

12. A color compression apparatus as claimed in claim 11, wherein the input-end gamut has a maximum lightness value Vmax and a minimum lightness value Vmin at the hue Hin,

wherein the lightness correcting portion calculates a lightness Vin' in the corrected input-end gamut that corresponds to the lightness Vin in the input-end gamut by calculating an equation of $Vin' = Vmin + (Vin - Vmin) \cdot (target - Vmin) / (V0 - Vmin)$ when $Vin \leqq V0$ or by calculating another equation of $Vin' = target + (Vin - V0) \cdot (Vmax - target) / (Vmax - V0)$ when $Vin > V0$.

13. A color compression apparatus as claimed in claim 12, further comprising a chroma determining portion determining a chroma Cin of the input color image data,

wherein the input-end gamut has a maximum chroma $Cmax_{(Vin)}$ at the lightness Vin and at the hue Hin,

wherein the lightness correcting portion corrects the

lightness Vin into a corrected lightness Vout by calculating an equation of $Vout = Vin + (Vin'-Vin) \times F(X)$, wherein $X = (Cin)/(Cmax_{(Vin)})$, and F(X) is a function with respect to X and satisfies a condition of $0 \leqq F(X) \leqq 1$ with respect to X that satisfies $0 \leqq X \leqq 1$ and F(X) is a monotone increasing function which increases from 0 to 1 as X increases from 0 to 1.

14. A color compression apparatus as claimed in claim 13, wherein the corrected input-end gamut has a maximum chroma $Cmax'_{(Vout)}$ at the lightness Vout and at the hue Hin,

wherein the output-end gamut has a maximum chroma $CT_{(Vout)}$ at the lightness Vout and at the hue Hin,

wherein the color compressing portion further includes a chroma correcting portion correcting the chroma Cin, and

wherein the chroma correcting portion calculates an equation of $Cout = Cin - (Cmax'_{(Vout)} - CT_{(Vout)}) \times Cin/Cmax'_{(Vout)}$.

15. A color compression apparatus as claimed in claim 8, wherein the input portion receives a set of input color image data (Rin, Gin, Bin),

wherein the color compressing portion further includes a converting portion converting the input color image data set (Rin, Gin, Bin) into a set of colorimetric data (Lin*, ain*, bin*),

wherein the lightness determining portion determines

the lightness Vin of the colorimetric data set (Lin*, ain*, bin*),

wherein the color compressing portion includes a chroma determining portion determining the chroma Cin of the colorimetric data set (Lin*, ain*, bin*),

wherein the hue determining portion determines the hue Hin of the input color image data directly based on the input color image data set (Rin, Gin, Bin),

wherein the lightness correcting portion corrects the lightness Vin into a corrected lightness Vout based on the hue Hin after the hue Hin has been determined, and

wherein the color compressing portion further includes a chroma correcting portion correcting the chroma Cin based on the hue Hin and on the corrected lightness Vout after the corrected lightness Vout has been generated.

16. A color compression method, comprising:

receiving input color image data which is defined for an input-end device and which is located in a predetermined input-end gamut; and

converting the input color image data into output color image data which is defined for an output-end device and which is located in a predetermined output-end gamut,

the color compression step including:

determining hue of the input color image data based on the input color image data.

17. A color compression method as claimed in claim 16, wherein the input color image data includes data of a color component of at least one of red and green,

wherein the hue determining step determines the hue of the input color image data based on the input color image data and on data of at least one hue that is calculated based on a measuring result of at least one color that is reproduced by the input-end device in response to input color image data indicative of at least one of primary colors of red and green.

18. A color compression method as claimed in claim 16, wherein the input color image data includes data of a blue color component,

wherein the hue determining portion determines the hue of the input color image data based on the input color image data and on data of a user's desired hue of the blue color designated by the user.

19. A color compression method as claimed in claim 16, wherein the output color image data includes data of a color component of at least one of cyan, magenta, and yellow,

wherein the hue determining step determines the hue of the input color image data based on the input color image data and on data of at least one hue that is calculated based on a measuring result of at least one color that is reproduced by the output-end device in response to output

color image data indicative of at least one of primary colors of cyan, magenta, red, and yellow.

20. A color compression method as claimed in claim 16, wherein the input color image data includes a set of data (Rin, Gin, Bin) including color components of red, green, and blue, and

wherein the hue determining step determines a hue Hin of the input color image data based on the input color image data (Rin, Gin, Bin) and on hue data HR, HG, and HB of red, green, and blue,

the data of hue HR having a value that is calculated based on a measuring result of a color that is reproduced by the input-end device in response to input color image data (255, 0, 0),

the data of hue HG having a value that is calculated based on a measuring result of a color that is reproduced by the input-end device in response to input color image data (0, 255, 0), and

the data of the hue HB having a value of a user's desired hue for blue, which is designated by the user.

21. A color compression method as claimed in claim 20, wherein the output color image data includes a set of data (Cout, Mout, Yout, Kout) including color components of cyan, magenta, yellow, and black,

wherein the hue determining step determines the hue

Hin of the input color image data based on the input color image data (Rin, Gin, Bin), on the hue data HR, HG, and HB, and on hue data HC, HM, and HY for cyan, magenta, and yellow,

the data of hue HC having a value that is calculated based on a measuring result of a color that is reproduced by the output-end device in response to output color image data (255, 0, 0, 0),

the data of hue HM having a value that is calculated based on a measuring result of a color that is reproduced by the output-end device in response to output color image data (0, 255, 0, 0), and

the data of hue HY having a value that is calculated based on a measuring result of a color that is reproduced by the output-end device in response to output color image data (0, 0, 255, 0).

22. A color compression method as claimed in claim 21, wherein the hue determining step calculates $H=HR+(HY-HR)*k$ when $Rin \geqq Gin \geqq Bin$, calculates $H=HG-(HG-HY)*k$ when $Gin \geqq Rin \geqq Bin$, calculates $H=HG+(HC-HG)*k$ when $Gin \geqq Bin \geqq Rin$, calculates $H=HB-(HB-HC)*k$ when $Bin \geqq Gin \geqq Rin$, calculates $H=HB+(HM-HB)*k$ when $Bin \geqq Rin \geqq Gin$, or calculates $H=HR-(HR+360-HM)*k$ when $Rin \geqq Bin \geqq Gin$, wherein $k=(M-S)/(L-S)$, L, M, and S are respectively the maximum value, the intermediate value, and the minimum value among the values Rin, Gin, and Bin in the input color image data (Rin, Gin,

Bin).

23. A color compression method, comprising:

receiving input color image data which is defined for an input-end device and which is located in a predetermined input-end gamut; and

converting the input color image data into output color image data which is defined for an output-end device and which is located in a predetermined output-end gamut,

the color compression step including:

determining hue Hin of the input color image data;

determining lightness Vin of the input color image data; and

correcting the lightness Vin;

the input-end gamut having a full-color lightness V0 at the hue Hin, and the output-end gamut having a full-color lightness V02 at the hue Hin,

the lightness correcting step including:

determining, based on a difference between the values V0 and V02, a target lightness "target" indicative of a full-color lightness of a corrected input-end gamut at the hue Hin, the lightness correcting step correcting the lightness Vin based on the target lightness "target".

24. A color compression method as claimed in claim 23,

wherein the lightness determining step determines the target lightness "target" as equal to the full-color lightness V02 when the difference between the values V0 and V02 is smaller than or equal to a predetermined threshold value.

25. A color compression method as claimed in claim 24, wherein the lightness determining step determines the target lightness "target" as a value between the values V0 and V02 when the difference between the values V0 and V02 is greater than the predetermined threshold value.

26. A color compression method as claimed in claim 25, wherein the lightness determining step determines, when the difference between the values V0 and V02 is greater than the predetermined threshold value, the target lightness "target" by calculating an equation of target = K * (V0-V02)+V02, wherein $0 \leqq K \leqq 1$.

27. A color compression method as claimed in claim 26, wherein the input-end gamut has a maximum lightness value Vmax and a minimum lightness value Vmin at the hue Hin,

wherein the lightness correcting step calculates a lightness Vin' in the corrected input-end gamut that corresponds to the lightness Vin in the input-end gamut by calculating an equation of $Vin' = Vmin + (Vin - Vmin) \cdot (target - Vmin) / (V0 - Vmin)$ when $Vin \leqq V0$ or by calculating another equation of $Vin' = target + (Vin - V0) \cdot (Vmax - target) / (Vmax - V0)$ when $Vin > V0$.

28. A color compression method as claimed in claim 27, further comprising a chroma determining step determining a chroma Cin of the input color image data,

wherein the input-end gamut has a maximum chroma $Cmax_{(Vin)}$ at the lightness Vin and at the hue Hin,

wherein the lightness correcting step corrects the lightness Vin into a corrected lightness Vout by calculating an equation of $Vout = Vin + (Vin'-Vin) \times F(X)$, wherein $X = (Cin)/(Cmax_{(Vin)})$, and F(X) is a function with respect to X and satisfies a condition of $0 \leqq F(X) \leqq 1$ with respect to X that satisfies $0 \leqq X \leqq 1$ and F(X) is a monotone increasing function which increases from 0 to 1 as X increases from 0 to 1.

29. A color compression method as claimed in claim 28, wherein the corrected input-end gamut has a maximum chroma $Cmax'_{(Vout)}$ at the lightness Vout and at the hue Hin,

wherein the output-end gamut has a maximum chroma $CT_{(Vout)}$ at the lightness Vout and at the hue Hin,

wherein the color compressing step further includes a chroma correcting step correcting the chroma Cin, and

wherein the chroma correcting step calculates an equation of $Cout = Cin - (Cmax'_{(Vout)} - CT_{(Vout)}) \times Cin/Cmax'_{(Vout)}$.

30. A color compression method as claimed in claim 23, wherein the input step receives a set of input color image

data (Rin, Gin, Bin),

wherein the color compressing step further includes a converting step converting the input color image data set (Rin, Gin, Bin) into a set of colorimetric data (Lin*, ain*, bin*),

wherein the lightness determining step determines the lightness Vin of the colorimetric data set (Lin*, ain*, bin*),

wherein the color compressing step includes a chroma determining step determining the chroma Cin of the colorimetric data set (Lin*, ain*, bin*),

wherein the hue determining step determines the hue Hin of the input color image data directly based on the input color image data set (Rin, Gin, Bin),

wherein the lightness correcting step corrects the lightness Vin into a corrected lightness Vout based on the hue Hin after the hue Hin has been determined, and

wherein the color compressing step further includes a chroma correcting step correcting the chroma Cin based on the hue Hin and on the corrected lightness Vout after the corrected lightness Vout has been generated.